REMARKS

The Applicants submit the current Amendment in conjunction with a Request for Continued Examination of the present application filed concurrently with this Amendment. By this Amendment certain claims have been amended as set forth above to overcome the Examiner's rejections as stated in the final Office Action and new claims 26-31 have been added. Claims 1-18 and 20-31 remain in the application for reconsideration by the Examiner. The Examiner's allowance of all pending claims is earnestly solicited.

In the final Office Action the Examiner rejects claim 1 under Section 102(a) as anticipated by Parkhe (6,854,533), claims 1-6 and 10-13 under Section 103(a) as unpatentable over admitted prior art in view of Parkhe and claims 7-9 and 14 under Section 103(a) as unpatentable over admitted prior art in view of Parkhe and Chen (6,785,096).

To further define the invention over the cited art, the Applicants have amended claim 1 as set forth above in the marked-up version of the claim. In particular, the Applicants have added a third paragraph, "controlling a chuck temperature to raise the wafer temperature in the absence of an active cooling mechanism between the wafer and the chuck, and wherein the chuck temperature is greater than the wafer temperature causing heat flow from the chuck to the wafer." Support for this change can be found at paragraph [0027]. Since heat flows from the chuck to the wafer, the chuck heats the wafer.

Parkhe discloses backside cooling flow beginning at line 31 of column 9. He also discloses beginning at line 66 of column 8, "inlet and outlet cooling lines 218 and 220 provide a forward and a return path for a coolant (i.e., water) to the cooling plate 107. The coolant is circulated through the cooling channels 236 to reduce the temperature of the electrostatic chuck 105." Parkhe further discloses the wafer in contact with the backside coolant flowing through the grooves 210 in an upper surface of the electromagnetic chuck 105.

In Background paragraph [0015] the Applicants refer to embedded heaters in the chuck that heat the chuck and the use of backside cooling to maintain the wafer temperature at the chuck temperature. The Applicants further state, "Since the frictional forces of the impinging sputtered atoms can raise the wafer temperature above the chuck temperature, the gas cools the wafer 106 (referred to as backside cooling) as it flows between the wafer 106 and

the chuck 126. With heat transfer from the gas, the chuck may also serve as a heat sink." The Applicants' further state in the same Background paragraph, "without backside cooling, the wafer temperature increases with time, approaching the plasma temperature." Thus Parkhe appears to add little to the Applicant's Background discussion that discloses heat flow from the wafer to the chuck via the backside cooling mechanism, cooling the wafer (lowering the wafer temperature) to the chuck temperature. By contrast, Applicants' amended claim 1 states, "controlling a chuck temperature to raise the wafer temperature."

As the Applicants describe in paragraph [0027] of the Detailed Description of the Invention, "Wafer backside cooling is not required according to the teachings of the present invention. Thus absent backside cooling, there is no coolant fluid force directed against the bottom surface of the wafer 106 and no need for an additional downward force, such as by use of a clamp to overcome the coolant fluid force."

Thus claim 1 as amended includes "controlling the chuck temperature to raise the wafer temperature to within the temperature range in the absence of an active cooling mechanism between the wafer and the chuck."

Parkhe states beginning at line 24 of column 9 that "the heater electrode 222 generates heat, which is thermally conducted through the cooling plate body 234 and the electrostatic chuck 105 to maintain the workpiece at proper processing temperatures."

Here again Parkhe discloses the use of a cooling mechanism (the cooling plate body 234), that is absent from the Applicants' invention as set forth in amended claim 1.

Based on the Applicants' remarks herein, it is respectfully submitted that amended claim 1 is patentably distinct from the cited art.

It is further respectfully submitted that each of the rejected dependent claims 2-14, depending from amended independent claim 1, includes one or more elements that further distinguish the invention over the art of record. These claims should therefore be in condition for allowance. Claims 8, 9 and 14 have been amended to comport with the amendments to claim 1 from which they depend.

In particular as to claim 5, there is no disclosure in the cited art that "positioning the wafer at a distance from the target such that the wafer temperature exhibits a greater dependence on a chuck temperature than on other parameters associated with the method for

depositing material on the semiconductor wafer." The Applicants' state in paragraph [0030] that, "at a distance of about 45 millimeters, the heat generated by the plasma and by the frictional forces of the impinging deposition particles are not dominant heat sources for the wafer. Instead, the temperature is determined primarily by radiant heat flow from the chuck 150, as heated by chuck heaters 156 under control of a temperature controller 158." In fact, the Applicant's teachings yield these unexpected results, as according to the prior art the frictional forces of the impinging deposition particles are the dominant heat sources for the wafer 106, and this heat must be removed from the wafer using the chuck as a heat sink. Thus, the new and unexpected result according to the Applicants' invention is different in kind and not merely in degree from the results of the prior art.

The Examiner suggests that the limitations of claim 5 would have been obvious to one of skill in the art based on the admitted prior art and Parkhe. The Applicants suggest that there is no support for this contention in the art. It is merely a hindsight rejection that could not have been proffered without knowledge of the Applicant's invention and is without any support in the cited art.

The Examiner is invited to carefully review new dependent claims 27-31, each depending from amended claim 1 and each claiming limitations not present in the cited art.

Claims 15-25 stand rejected under Section 103 as unpatentable over the Applicants' admitted prior art in view of Parkhe and Chen.

To further clarify and define the invention as set forth in independent claim 15, the Applicants have amended the last paragraph to read, "a chuck for supporting the wafer while depositing material on the wafer solely based on gravitational forces directed against the wafer with the wafer spaced apart from the target by about 45 mm."

Parkhe discloses the use of an electrostatic chuck 105, and at line 67 of column 5 explains, "The chucking electrodes 224 [of the electrostatic chuck 105] are disposed relatively close to the top surface 103 of the electrostatic chuck 105. In this manner, the chucking electrodes 224 provide the necessary electrostatic force to the backside of the workpiece [the wafer] . . . to retain the workpiece on the electrostatic chuck 105." In contrast, the Applicants teach and claim that the chuck supports the wafer solely in response to gravitational forces directed against the wafer.

Chen discloses, "The substrate 408 is clamped to a heater pedestal electrode 454 by, for example, a clamp ring 456 although electrostatic chucking may alternatively be employed." See column 12, lines 48-50. The application is distinguished from Chen as the Applicants teach a chuck supporting the wafer solely based on gravitational forces directed against the wafer, as set forth in amended independent claim 15.

Further neither Parkhe nor Chen discloses "the wafer is spaced apart from the target by about 45 mm." As the Applicants describe at paragraph [0030], at about 45 mm the heat generated by the plasma and by the frictional forces of the impinging deposition particles are not dominant heat sources for the wafer 106.

Thus the combination of the Applicants' background discussion and the Parkhe and Chen patents fails to disclose or suggest the Applicants' invention as set forth in amended claim 15.

There is also no disclosure for making the combination proposed by the Examiner, much less a disclosure as to specifically how the references could be combined. The Examiner's reference to Chen as "analogous art," and reliance thereon for making the combination does not satisfy the requirements for combining references. There must be some basis, motivation or suggestion in at least one of the cited references for making the proposed combination.

With respect to the dependent claims 18 and 20-26, depending directly or indirectly from amended independent claim 15, it is respectfully submitted that each of these dependent claims includes one or more elements that further distinguish the invention over the art of record. These claims should therefore be in condition for allowance.

Claim 19 has been cancelled without prejudice. The cancellation of this claim should not be construed as an admission as to the applicability of the cited art or the propriety of the rejection. The Applicants reserve the right to prosecute this claim or a similar claim in a continuing application.

It is believed that the claims as presented herein in conjunction with the Request for Continued Examination distinguish the invention from the art of record. It is therefore respectfully requested that the Examiner reconsider his rejections and issue a Notice of Allowance for all claims pending in the application.

The Applicants hereby petition for an extension of time of one month under 37 C.F.R. 1.136. A check in the amount of $120.00 in payment of the extension fee is enclosed.

If a telephone conference will assist in clarifying or expediting this Amendment or the claim changes made herein, the Examiner is invited to contact the undersigned at the telephone number below.

Respectfully submitted,

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CERTIFICATE OF MAILING

I HEREBY CERTIFY that this Amendment (including Attachment 1) is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 15th day of August 2005.

Pamela A. Pagel